

Claims

- [c1] An apparatus for conducting a high speed search on an optical medium having a surface on which information is recorded comprising:
 - a photodetector unit configured to receive a reflected component of a first light spot to form a first electrical signal and a reflected component of a second light spot to form a second electrical signal;
 - digital shaping circuitry configured to respectively convert the first electrical signal and the second electrical signal into a first digital signal and a second digital signal; and
 - a detector configured to receive the first digital signal and the second digital signal to produce from the first digital signal and the second digital signal an up-count signal and a down-count signal indicating directions that the light spots traverse.
- [c2] The apparatus of claim 1 wherein the surface includes a plurality of tracks.
- [c3] The apparatus of claim 2 wherein one of the first light spot and the second light spot is directed by an optical system on to the optical medium.

- [c4] The apparatus of claim 3 wherein the up-count signal indicates the first light spot is traversing the tracks in a first direction and the down-count signal indicates the second light spot is traversing the tracks in a second direction.
- [c5] The apparatus of claim 4, further comprising:
a counter configured to count, during the search, the up-count signal and the down-count signal to determine a number of tracks traversed by the light spots.
- [c6] The apparatus of claim 4, further comprising:
a microcomputer coupled to the quadrature detector and configured to count, during the search, the up-count signal and the down-count signal to identify a number of tracks traversed by the light spots.
- [c7] The apparatus of claim 4, wherein:
the first light spot and the second light spot are arranged on the tracks in a quadrature relationship to each other.
- [c8] The apparatus of claim 4, wherein:
the first electrical signal and the second electrical signal are arranged on the tracks in a quadrature relationship to each other.

- [c9] The apparatus of claim 4, wherein:
the first digital signal and the second digital signal are arranged in a quadrature relationship to each other.
- [c10] The apparatus of claim 9, wherein:
the quadrature relationship is characterized by about a 90-degree shift between the first digital signal and the second digital signal.
- [c11] The apparatus of claim 9, wherein:
the quadrature relationship is characterized by a tolerance relationship between the first digital signal and the second digital signal, the tolerance relationship being determined so that the first digital signal and the second digital signal vary within a specified number of degrees of 90 degrees as permitted by a tolerance parameter of the quadrature detector.
- [c12] The apparatus of claim 9, wherein:
the quadrature relationship is characterized by the first digital signal leading the second digital signal in time.
- [c13] A method for conducting a high speed search, comprising:
directing a first and a second light spots onto an optical medium, the light spots traversing across the surface of the optical medium;

receiving a reflected component of the first light spot to form a first electrical signal and a reflected component of the second light spot to form a second electrical signal;

shaping the first electrical signal and the second electrical signal into a first digital signal and a second digital signal; and

determining from the first digital signal and the second digital signal an up-count signal and a down-count signal.

- [c14] The method of claim 13 further comprising directing the first and second light spots to form a quadrature relationship to each other.
- [c15] The method of claim 13 wherein the surface comprises a plurality of tracks.
- [c16] The method of claim 15 wherein the first and second signals respectively indicate the light spots traversing the tracks in a first and a second direction.
- [c17] The method of claim 16, further comprising:
counting the up-count signal and the down-count signal to estimate a number of tracks traversed by the light spots.
- [c18] A method for conducting a high-speed search, compris-

ing:

determining a target track over which an optical system is to be positioned;

measuring a current track over which the optical system is currently positioned;

determining a distance (d) between the target track and the current track;

moving in an open loop mode the optical system at one of a plurality of rates of motion until the optical system rests, to each one of the plurality of rates of motion there being assigned one interval from a plurality of disjoint intervals, wherein if d falls within one of the disjoint intervals the optical system is moved the corresponding rate of motion; and

measuring the current track to recalculate d.

- [c19] The method of claim 18 further comprising repeating the moving step until d is sufficiently small.
- [c20] The method of claim 18 further comprising moving the optical head one track at a time in a closed loop mode until the target track is reached.